

Assessing the Outcomes of Competency-Based Education in Secondary Schools in Ibadan, Oyo State, Nigeria

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This study evaluates the outcomes of competency-based education (CBE) for student engagement and learning outcomes in secondary schools in Ibadan, Oyo State, Nigeria, within the broader context of national curriculum reforms emphasizing skills and employability. Employing a convergent mixed-methods design, the study integrated quantitative survey data from 150 students and 30 teachers across five secondary schools with qualitative data from semi-structured interviews with 12 purposively selected teachers. The study was guided by CBE implementation model multidimensional framework of student engagement. Quantitative results showed that students exposed to CBE reported significantly higher engagement ($M = 4.20$, $SD = 0.80$) than those taught using traditional methods ($M = 3.10$, $SD = 1.00$), with a large effect size (Hedges' $g \approx 1.17$). Standardized test performance improved from a pre-implementation mean of 58% ($SD = 10\%$) to 75% ($SD = 12\%$; $p < 0.001$). Qualitative findings highlighted perceived benefits of CBE for critical thinking and practical application of knowledge, alongside substantial challenges such as limited teacher training, inadequate resources, and weak policy support at school level. The findings underscore the need for targeted professional development, adequate resource allocation, and alignment of assessment systems with CBE principles. Limitations relating to sample size, sampling strategy, and contextual variability are discussed, with implications for policymakers and practitioners seeking to deepen CBE implementation in Nigerian secondary education.

Keywords: competency-based education, student engagement, academic performance, secondary education, Nigeria, mixed-methods

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Nigeria's educational system is undergoing continued reform to increase relevance, quality, and responsiveness to 21st-century workforce demands (Federal Ministry of Education, 2013). National policy documents call for curricula that move beyond rote memorization to foster skills such as critical thinking, problem solving, and lifelong learning (Osarenren-Osaghae & Irabor, 2018). Within this context, competency-based education (CBE) has gained prominence as an approach that emphasizes mastery of clearly defined competencies integrating knowledge, skills, and dispositions at learners' own pace (Gervais, 2016; McClarty & Gaertner, 2015; Thakaberry, 2017).

Globally, CBE has been promoted as a framework for making learning outcomes explicit, aligning teaching and assessment with real-world performance, and supporting more flexible pathways through education (Gagnon, 2024; National Conference of State Legislatures, 2020; XQ Institute, 2023). In African contexts, shifts towards competency-based curricula are evident in several countries, including Kenya and Tanzania, with reported potential for developing higher-order skills and improving learner engagement (Cheptoo & Ramadas, 2019; Muneja, 2015; Tarmo & Kimaro, 2021). In Nigeria, recent work has conceptualized competency-based curriculum reforms as a necessary step for addressing skills gaps and strengthening employability (Kabombwe & Mulenga, 2019; Osarenren-Osaghae & Irabor, 2018). However, empirical evidence on CBE implementation and outcomes in Nigerian secondary schools remains limited and uneven. Studies across the region suggest that traditional teacher-centered pedagogies and exam-focused assessments often fail to adequately prepare students for practical and professional challenges (Dlamini & Dlamini, 2018; Muneja, 2015; Penprase, 2018). In addition, constraints such as poor infrastructure, limited teaching resources, and insufficient teacher preparation have been identified as major barriers to effective CBE implementation (Govender, 2018; Muraraneza & Mtshali, 2018; Ngeno, 2023).

Within Ibadan and the broader South-West Nigeria context, research has emphasized teacher competencies, assessment practices, and learning outcomes, but has rarely focused explicitly on CBE as a coherent model (Adodo, 2014; Isah & Ajamobe, 2016; Lasisi & Oni, 2016; Lawal et al., 2017). There is therefore a need for context-specific, empirical studies examining how CBE is interpreted, implemented, and experienced in Nigerian secondary schools, and how it impacts student engagement and academic performance.

Theoretical Framework

This study is guided by two complementary frameworks. The first is the CBE program model by Parsons et al. (2023), which identifies key design and implementation components such as explicit competency frameworks, aligned instruction and assessment, flexible pacing, and continuous feedback. This framework provides a lens for examining how CBE is structured and operationalized in school settings. The second is Fredricks et al.'s (2004) multidimensional model of student engagement, which conceptualizes engagement as comprising behavioral (participation, effort, persistence), emotional (interest, enjoyment, belonging), and cognitive

(self-regulation, strategic thinking) dimensions. This framework informs the measurement and interpretation of student engagement outcomes associated with CBE relative to traditional instructional approaches.

Purpose of the Study

The purpose of this convergent mixed-methods study is to assess the outcomes of CBE in selected secondary schools in Ibadan, Oyo State, Nigeria, with a particular focus on student engagement and academic performance, teacher perceptions, implementation challenges, and strategies for improvement.

Research Questions

1. What are secondary school teachers' perceptions and understandings of CBE in Ibadan?
2. How does CBE contribute to students' engagement and academic performance in the selected schools?
3. What challenges do educators face in implementing CBE effectively in this context?
4. What strategies do teachers and school actors suggest to enhance CBE implementation?

Methods

Research Design

A convergent mixed-methods design was adopted to obtain a comprehensive understanding of CBE's effectiveness in the selected schools (Creswell & Plano Clark, 2017; Fetter et al., 2013). Quantitative and qualitative data were collected concurrently, analyzed separately, and then integrated during interpretation. Quantitative survey data provided estimates of engagement and performance differences between CBE and traditional instruction, while qualitative interviews offered in-depth insights into teachers' perceptions, experiences, and recommendations.

Participants and Sampling

Five secondary schools in Ibadan were purposively selected to represent a range of socio-economic and administrative contexts (Etikan et al., 2016). Within these schools, 150 students and 30 teachers participated in the quantitative survey. The student sample included learners across different grade levels and subject areas to capture varied experiences with CBE. Students were aged 14–18 years ($M = 16.20$, $SD = 1.10$), with 60% female. Among teachers, 53.3% were female and the mean teaching experience was 8.30 years ($SD = 5.20$), with 60% reporting some prior CBE-related training. For the qualitative strand, 12 teachers were purposively selected based on having at least one year of experience implementing CBE-oriented practices and willingness to participate in semi-structured interviews. The selection was designed to achieve variation in subject specialization, school type, and years of experience, and data collection continued until thematic saturation was reached.

Sample Size Considerations

Although the student ($N = 150$) and teacher ($N = 30$ survey; $N = 12$ interviews) samples are modest, they are adequate for detecting medium to large effects in group comparisons and for generating rich qualitative data (Dillman et al., 2014; Kvale & Brinkmann, 2015). Nevertheless, the use of purposive and convenience sampling limits statistical generalizability beyond similar urban secondary schools in Oyo State. The mixed-methods approach is intended to offset some of these limitations by enabling triangulation and contextual interpretation.

Instruments

Student Questionnaire

The student questionnaire was adapted from established engagement scales grounded in Fredricks et al.'s (2004) multidimensional model. Items assessed behavioral (e.g., participation, persistence), emotional (e.g., interest, enjoyment), and cognitive (e.g., effortful processing, self-regulation) engagement in learning, along with perceptions of CBE-related activities, motivation, and perceived learning outcomes. Responses were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Teacher Questionnaire

The teacher questionnaire assessed:

- Understanding and perceptions of CBE and its perceived impact on learning outcomes.
- Self-reported adequacy of training and confidence in implementing CBE.
- Observed changes in student engagement and performance following CBE implementation.
- Perceived institutional support and resource availability.

Items were rated primarily on 5-point Likert scales, with some open-ended questions for elaboration. Both questionnaires were pilot-tested with 20 students and 15 teachers from schools not included in the main sample to ensure clarity, relevance, and reliability. Minor revisions were made to item wording following feedback from the pilot phase.

Semi-Structured Interview Guide

Questions were informed by the Parsons et al. (2023) implementation framework and by prior research on CBE in African contexts (Kabombwe & Mulenga, 2019; Muraraneza & Mtshali, 2018; Ngeno, 2023). The interview guide explored:

1. Teachers' understanding and interpretations of CBE.
2. Experiences designing and implementing competency-based lessons and assessments.
3. Perceived benefits and drawbacks of CBE for student engagement and learning.
4. Challenges encountered, including training, resources, and policy alignment.

5. Recommendations for strengthening CBE implementation in Nigerian secondary schools.

Data Collection Procedures

Quantitative data were collected through paper-based questionnaires administered during regular school hours with the cooperation of school administrators. Participation was voluntary and no incentives were provided. Completed questionnaires were coded and entered into IBM SPSS Statistics Version 27 for analysis. Qualitative data were collected through individual semi-structured interviews conducted in quiet spaces within the schools. Each interview lasted approximately 35–50 minutes and was audio recorded with participants' consent. Interview recordings were transcribed verbatim for analysis.

Data Analysis

Quantitative Analysis

Data were cleaned and screened for missing values, outliers, and normality. Descriptive statistics summarized demographic variables and key constructs. Engagement scores were computed as mean scale scores. To compare student engagement levels between those taught using CBE and those taught with traditional methods, independent samples *t* tests were conducted, with significance levels set at $p < 0.05$. Hedges' *g* was calculated to estimate effect sizes, accounting for sample size differences. For academic performance, paired *t* tests were used to compare standardized test scores before and after CBE implementation for the same group of students where data were available.

Qualitative Analysis

Qualitative data were analyzed using Braun and Clarke's (2006) thematic analysis approach. Initial codes were independently generated by two coders who read the transcripts multiple times to identify meaningful segments. Codes were then grouped into candidate themes capturing teachers' perceptions, experiences, challenges, and recommendations. The coding framework was iteratively refined through discussion and comparison across transcripts. Interrater reliability was assessed using Cohen's kappa, yielding $\kappa = 0.82$, which indicates strong agreement between coders. Themes were further reviewed to ensure coherence and alignment with the research questions and theoretical frameworks.

Ethical Considerations

Ethical approval for the study was obtained from the participating schools and relevant local authorities. Informed consent was obtained from all adult participants and from parents or guardians for student participants, with student assent also secured. Participation was voluntary and participants were informed that they could withdraw at any time without penalty. Data were anonymized through the use of pseudonyms and stored securely in password-protected files, following guidelines consistent with the American Educational Research Association's ethical standards (American Educational Research Association, 2011).

Results

Participant Demographics

Table 1 summarizes the demographic characteristics of student and teacher participants (*N* = 150 Students; *N* = 30 Teachers).

Table 1
Participant Demographics

Participants	Category	Frequency (n)	Percentage (%)
Students (<i>N</i> = 150)	Female	90	60.0
	Male	60	40.0
	Age 14-15	45	30.0
	Age 16-17	70	46.7
	Age 18	35	23.3
	Final Year Students (SS3)	105	70.0
Teachers (<i>N</i> = 30)	Female	16	53.3
	Male	14	46.7
	Experience (2-5 years)	10	33.3
	Experience (6-10 years)	12	40.0
	Experience (11+ years)	8	26.7

Perceptions of Competency-Based Education

As shown in Table 2, student and teacher perceptions of CBE were generally positive but revealed gaps in teacher preparation. Among students, 85% agreed that CBE enhances their engagement and 78% reported increased motivation. Among teachers, 72% perceived that CBE improves learning outcomes; however, only 45% felt adequately trained to implement it effectively, with 35% neutral and 20% disagreeing.

Table 2
Perceptions of Competency-Based Education (CBE)

Group	Statement	Agree (%)	Neutral (%)	Dis-agree (%)
Students (<i>N</i> = 150)	CBE enhances engagement	85	10	5
	CBE increases motivation	78	15	7
Teachers (<i>N</i> = 30)	CBE improves learning outcomes	72	20	8
	Adequately trained to implement CBE	45	35	20

These findings suggest that stakeholders generally recognize the potential benefits of CBE while highlighting significant professional development needs among teachers, echoing patterns reported in related African contexts (Govender, 2018; Ngeno, 2023).

Student Engagement

Students exposed to CBE reported significantly higher engagement scores in Table 3 ($M = 4.20$, $SD = 0.80$) compared to those taught using traditional methods ($M = 3.10$, $SD = 1.00$). The difference was statistically significant, $t(148) = 7.56$, $p < .001$. The effect size, estimated using Hedges’ g , was approximately 1.17, indicating a large practical effect of CBE on engagement.

Table 3
Student Engagement Levels by Method of Instruction

Method of Instruction	<i>N</i>	<i>M</i>	<i>SD</i>
Competency-Based Education (CBE)	75	4.20	0.80
Traditional Methods	75	3.10	1.00

These results align with Fredricks et al.’s (2004) framework by indicating that CBE is associated with increased behavioral and cognitive engagement, and support previous findings that learner-centered, competency-focused approaches can enhance student participation and motivation (Gervais, 2016; Marzano et al., 2022).

Academic Performance

Standardized test scores improved significantly following CBE implementation. Mean pre-CBE implementation scores were 58% ($SD = 10\%$), while post-CBE implementation scores increased to 75% ($SD = 12\%$) as shown in Table 4. A

paired-samples t test showed this difference to be statistically significant, $t(149) = 12.34, p < 0.001$.

Table 4
Academic Performance Outcomes (N = 150)

Assessment Period	M	SD	M_{diff}	SD_{diff}
Pre-CBE Implementation	58	10.0	17	12.34
Post-CBE Implementation	75	12.0		

Note. The paired-samples test: $M_{diff} = 17, t(149) = 12.34, p < 0.001$.

The magnitude of improvement suggests that CBE may have a substantial positive effect on academic achievement, consistent with research that links competency-based approaches with improved mastery and performance in diverse contexts (McClarty & Gaertner, 2015; Muneja, 2015).

Interview Findings

Four major themes emerged from the teacher interviews: challenges in implementation, perceived benefits of CBE, training needs, and recommendations for improvement. Representative excerpts are provided below.

Theme 1: Challenges in Implementation

Teachers highlighted limited training in CBE design and delivery, as well as shortages of resources and infrastructure. A teacher noted:

“Many of us received minimal training on CBE, which makes it difficult to design lessons that truly focus on competencies rather than content coverage.” (Teacher 3)

Resource constraints were also prominent:

“Limited resources, especially practical materials, hinder effective delivery of competency-based lessons.” (Teacher 7)

These challenges mirror findings from studies in other African systems where resource shortages and insufficient preparation hinder CBE implementation (Goven-der, 2018; Muraraneza & Mtshali, 2018; Maiyuria et al., 2024).

Theme 2: Perceived Benefits of CBE

Despite challenges, teachers reported that CBE fostered higher engagement, deeper understanding, and more practical application of knowledge:

“Students are more engaged when they can apply what they learn through hands-on activities, which is a shift from the usual lecture methods.” (Teacher 1)

Teachers also observed improvements in critical thinking and collaborative skills, consistent with the goals of competence-based reforms (Kabombwe & Mulenga, 2019; Gagnon, 2024).

Theme 3: Training Needs

Participants emphasized the necessity of ongoing, practice-oriented professional development:

“Continuous professional development tailored to CBE is essential for us to improve our teaching practices.” (Teacher 10)

Teachers expressed a desire for practical workshops on competency mapping, formative and performance-based assessment, and differentiated instruction aligned with CBE principles, similar to recommendations in teacher education literature (Marzano et al., 2022; Tarmo & Kimaro, 2021).

Theme 4: Recommendations for Improvement

Teachers stressed the importance of supportive leadership, clear guidelines, and resource provision:

“Support from school management and policymakers in terms of resources and clear guidelines would enhance CBE implementation.” (Teacher 5)

Suggested strategies included:

1. Strengthening alignment between curriculum standards, classroom assessments, and national examinations.
2. Providing adequate teaching and learning resources, including digital tools and practical materials.
3. Institutionalizing regular CBE-focused professional development.

Integration of Findings and Research Questions

Overall, the findings address the four research questions in an integrated way. Regarding teachers' perceptions (RQ1), survey and interview data indicate that teachers generally view CBE positively and believe it can improve learning outcomes, yet many feel underprepared and constrained by limited resources. In relation to student engagement and academic performance (RQ2), quantitative results show significantly higher engagement scores and notable gains in post-implementation test performance for students exposed to CBE. Concerning implementation challenges (RQ3), both quantitative and qualitative evidence highlight insufficient teacher training, resource shortages, and limited institutional support as key obstacles. Finally, the strategies suggested (RQ4)—including targeted professional development, improved resource allocation, clearer policy guidance, and alignment of assessment systems—provide actionable directions for strengthening CBE implementation in similar Nigerian secondary school contexts.

Discussion

The study contributes to the growing body of evidence suggesting that CBE can positively influence student engagement and academic performance in African secondary school contexts, including Nigeria. The significant differences in engagement scores between CBE and traditional instruction, along with substantial gains in

test scores, align with prior research emphasizing the potential of competency-based approaches to foster deeper learning and mastery (Gervais, 2016; McClarty & Gaertner, 2015; Muneja, 2015).

CBE, Engagement, and Learning Outcomes

The findings support Fredricks et al.'s (2004) model by demonstrating that CBE can influence behavioral, emotional, and cognitive engagement simultaneously. Students in CBE settings reported greater participation and interest, as well as higher perceived relevance of learning tasks, which likely contributed to improved academic outcomes. This pattern resonates with previous work indicating that learner-centered, active pedagogies can enhance engagement and performance when appropriately supported (Marzano et al., 2022; Rainwater, 2016).

From the perspective of Parsons et al.'s (2023) CBE framework, the observed improvements in engagement and performance suggest that core design elements such as clear competencies, performance-based tasks, and feedback are beginning to take root in the participating schools. However, the framework also emphasizes the importance of systemic alignment and sustained support, which remain underdeveloped in the current context.

Implementation Challenges and Systemic Constraints

Despite positive outcomes, this study confirms that the full potential of CBE is constrained by considerable implementation challenges. Many teachers did not feel adequately trained to design competency-based curricula, assessments, and learning experiences, a finding consistent with prior literature on teacher preparedness in CBE reforms (Govender, 2018; Ngeno, 2023; Tarmo & Kimaro, 2021). Resource shortages including limited access to instructional materials, technology, and conducive learning environments also hindered the use of practical and authentic assessments that are central to CBE (Maiyuria et al., 2024; Penprase, 2018). Additionally, participants perceived misalignment between CBE principles and high-stakes examinations that still emphasize recall and coverage of content. This tension between policy rhetoric and assessment realities has been noted in other CBE contexts and may undermine teacher motivation and fidelity of implementation (Kabombwe & Mulenga, 2019; Osarenren-Osaghae & Irabor, 2018).

Implications for Practice

The findings have several implications for practice in Nigerian secondary schools:

1. **Teacher Professional Development:** There is a need for sustained, practice-oriented professional development that focuses on translating CBE principles into classroom practice, including competency mapping, formative and performance-based assessment, and differentiation. Such initiatives could be integrated into existing teacher education and in-service training structures (Marzano et al., 2022; Tarmo & Kimaro, 2021).
2. **Resource Provision and Infrastructure:** Effective CBE requires access to adequate learning resources, including laboratories, instructional materials,

and digital tools that support hands-on, project-based, and collaborative learning. Investments in infrastructure and school-level budgeting should explicitly consider CBE requirements (Maiyuria et al., 2024; Penprase, 2018).

3. **Leadership and School Culture:** School leaders play a critical role in creating a culture that values innovation, collaboration, and continuous improvement. Encouraging teacher collaboration around curriculum design, assessment, and reflective practice can strengthen CBE implementation and sustainability (Marzano et al., 2022).

Implications for Policy

At the policy level, the study underscores the need to align national and state assessment frameworks with competency-based principles by valuing demonstration of skills, application, and higher-order thinking alongside content knowledge (National Conference of State Legislatures, 2020; Osarenren-Osaghae & Irabor, 2018). Policies should also provide clear guidelines and benchmarks for CBE implementation, including expectations for teacher competencies and school-level support. Moreover, funding mechanisms and accountability systems should incentivize schools to adopt and refine CBE practices, rather than reinforcing exclusive reliance on traditional, exam-focused pedagogy. Partnerships between government agencies, universities, and professional bodies could support research-practice collaborations and continuous improvement in CBE implementation (DeBacker et al., 2024).

Limitations and Directions for Future Research

Several limitations should be considered when interpreting the findings. First, the use of purposive sampling and the modest sample sizes limit the generalizability of results beyond similar urban secondary schools in Ibadan and related contexts. Second, the study relied on self-report measures of engagement and perceptions, which may be affected by social desirability bias. Third, although pre- and post-CBE performance data were analyzed, the study design was not fully experimental, and unmeasured variables (such as teacher effectiveness or school-level initiatives) may have contributed to observed improvements. Future research should employ larger, more diverse, and representative samples across different regions and school types in Nigeria, and consider longitudinal or quasi-experimental designs to better isolate the effects of CBE on engagement and achievement over time. There is also a need for classroom-based observational studies that examine how CBE is enacted in practice, as well as studies that explore students' and parents' perspectives on CBE, particularly in relation to equity and inclusion.

Conclusion

This study provides empirical evidence that competency-based education holds substantial promise for enhancing student engagement and academic performance in secondary schools in Ibadan, Oyo State, Nigeria. Students exposed to CBE re-

ported higher engagement and achieved significantly better standardized test scores than their peers in traditional classrooms. At the same time, the study reveals that inadequate teacher preparation, limited resources, and misalignment between policy aspirations and assessment systems constrain the full realization of CBE's potential. Integrating frameworks such as Parsons et al. (2023) and Fredricks et al. (2004) into program design, teacher development, and evaluation efforts can support more coherent and effective CBE implementation. Future work should build on these findings to design scalable, context-sensitive interventions that strengthen CBE across Nigeria's secondary education system.

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